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Clinical Practice Guideline for Screening, Diagnosing, Referring and Monitoring of Cytomegalovirus Retinitis

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VISIT OUR WEBSITE: WWW.ASORN.ORG
CMV retinitis is a sight-threatening complication of HIV/AIDS. Enjoy this month's CE which provides an evidence-based clinical practice guideline!
Remember the Patients, Because They Remember Us

EACH DAY WE GO INTO WORK, we come into contact with patients. It doesn’t matter if we are employed in an office setting or an ASC, patients are everywhere! We have seen thousands of them over the years, but some stand out and we remember them long after they are gone. Some of them remember us, too.

As many of you know, because you read the article in Insight or have heard me speak on the topic, I had the privilege of participating in cataract surgery on a Western Lowlands gorilla a few years ago. It was reported by the veterinarians that she was having trouble finding her food and was not socializing with the other gorillas. Seeing Timbo lying on the OR table at the zoo, (under general anesthesia, of course!), was amazing. Even though she was asleep I still talked to her while I prepped her since they say that hearing is the first sense to come back. I guess she heard me, because when we went to see her post op I spoke to her and she responded to my voice. It was thrilling, really, to be “communicating” with her. She remembered me.

Operating on a gorilla is truly unique and easy to remember, but I have had a few human patients who stood out to me, too. Early in my nursing career, back in Chicago, I participated in cataract surgery on a patient who was deaf and mute. His vision had deteriorated so badly that all he could do to communicate was sign by holding hands with his wife. In the operating room it was necessary to move slowly and gently while attending to him. We couldn’t comfort him by talking to him, so I held his hand.

At the time, doing blocks was the norm, and so after uneventful cataract surgery he was patched and sent home. The surgeon told us that when he was in the office on the first day post op and the patch was removed the patient jumped out of the exam chair, so excited that he could see again. He pumped the surgeon’s hand with a big handshake and looked into the face of his wife while they both cried. What a life altering experience for him!

When he came back for his second eye he remembered me, not because he could see me, because he couldn’t see me the first time, but because of the way I touched him when I prepped him and held his hand.

While working in Dallas I scrubbed on a procedure for a man who had been hit in the eye by a tree branch while skiing. His traumatic cataract had been removed around the time of the injury, but he also had corneal scarring and his iris was only attached for two clock hours, from 8 to 10 and the rest was floating around in his anterior chamber. The surgeon and I had a discussion about how to proceed. He wound up taking off the cornea, suturing in a posterior chamber IOL, tacking the iris back in place and suturing in a new cornea. A couple of months post op the surgeon mentioned the patient would be in his office the following day and invited me to come and view our handiwork. Amazingly he was 20/40 uncorrected. I thanked him for letting me examine him with the slit lamp and he said “It’s you. I remember hearing your voice in the operating room when my procedure was being done and always wondered who you were.”

For us, there are many of them, but for them, there is only one of us. They see our facial expressions, they hear the tone of our voice, and they pay attention to how we treat them. It doesn’t matter to them if our copier is broken or we don’t have enough staff. They want us to pay attention to them. We are with them when they are diagnosed with a cataract or glaucoma or a retinal detachment. And we are with them when they are afraid as they go to the operating room to have a procedure to fix a problem or prevent further damage. They remember us.

So when we go to work and the usual frustrations pop up, we need to put those things aside and remember why we are really there. We need to remember the patients, and do our best for them, because they will remember us.
Are You Thriving . . .

IT IS RARE THAT I HAVE THE LUXURY of time to read anything other than a patient chart, textbook or manuscript. Recently, however, a long plane trip with a dead laptop battery led me to the bookstore pre-boarding. It was such a rare occurrence for me that, what most consider a scant selection of mostly New York Times Best Sellers, seemed like an overwhelming library of choices. Eventually, I settled on the book *Thrive* by Arianna Huffington, the editor-in-chief and co-founder of the Huffington Post. The Huffington Post is an online news resource and blog that was created in 2005 and has become wildly successful. Her book, *Thrive*, has nothing to do with the news or political views; rather, it is an autobiography of sorts with introspection into the successes, failures and challenges of being successful while maintaining a balanced life. To that end, she encourages readers to explore what success truly is and discourages success defined solely by money and power. She instead explores the concepts of well being, wonder and wisdom in an attempt to redefine success.

Throughout the book the reader is faced with two questions . . .

**What is my definition of success?**

**Do I live a balanced life?**

I am sure that you agree with me in that these are difficult questions to answer. However, the answers (your answers) provide an essential foundation in defining the path your life will take, both personally and professionally. Some might say that if you thrive in one area of your life that you are sacrificing other areas of your life. Personally, I believe that if you infuse balance into all areas of your life that you can have it all!

This copy of *Insight* will find a nice spot on your coffee table just after the Autumnal Equinox, marking the beginning of autumn. As autumn falls into winter, the year closes. What a perfect time to refine your definition of success and well-being! Did you know that the month of January has the highest gym membership join rate of the year? It is nearly 25% greater than other months, as often New Years Resolutions include a new exercise plan. Consider all of the elements of your life. What are your goals for the year 2015?

As an ASORN member, how are you contributing to your professional nursing association? While I would love to have all of you as prolific writers, I realize that writing is not everyone’s gift. ASORN has so many opportunities available for each of you to contribute to. So as you enjoy the gifts that fall brings—beautiful leaves, cool breezes, pumpkin patches—find time for reflection, refine your definition of success, make time to create goals for 2015, and include ASORN in your plans!

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Clinical Practice Guideline for Screening, Diagnosing, Referring and Monitoring of Cytomegalovirus Retinitis

Cytomegalovirus retinitis (CMVR) warrants prompt diagnosis and treatment to halt its progression, thereby preserving the remaining vision and saving the contralateral eye from the destructive infection. A clinical practice guideline for screening, diagnosing, referring, and monitoring CMVR was written with the goal of providing a blueprint for a standard of care to guide clinicians in identifying signs and symptoms, diagnosing the condition, referring diagnosed patients for prompt medical and surgical treatment, and monitoring patients with CMVR. Systematic review and assessment of the strength and quality of the evidence and recommendations of research studies, scholarly publications, and related clinical guidelines about screening, diagnosing, referring, and monitoring of CMVR were performed. Algorithms that outline the steps for screening, diagnosing, referring, and monitoring of newly diagnosed patients with CMVR, previously diagnosed CMVR with immune compromise, and previously diagnosed CMVR with immune recovery were developed. Having a clinical practice guideline should improve clinician decision making and enhance outcomes of patients with CMVR.

Keywords: cytomegalovirus retinitis, HIV/AIDS ocular complication, cytomegalovirus retinitis clinical practice guideline, screening for CMVR, diagnosing CMVR, referring CMVR, monitoring for CMVR

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Approximately 70% of the 34 million patients with HIV/AIDS around the world develop HIV/AIDS ocular complications in their lifetime (Centers for Disease Control and Prevention [CDC], 2013; Sahoo, 2010). The most common and severe HIV/AIDS ocular complication, which causes partial or total blindness due to full thickness necrosis of the retina, is cytomegalovirus retinitis (CMVR) (Geng, Ye, Zhao, Li & Han, 2011; Wang, Jia, Ge, He & Fan, 2012). Cytomegalovirus (CMV) is a double-stranded DNA virus of the Herpesviridae family that replicates mainly in the salivary glands and kidneys and is shed in the saliva and urine. Its transmission is through contact with body fluids, via placental transfer, or by hematopoietic stem cell or solid organ transplantation (Jacobsen & Sifontis, 2010; Ljungman, Hakki, & Boeckh, 2011). CMV rarely causes disease among immune-competent individuals, but it is the major cause of mortality and morbidity among immune-compromised patients with HIV/AIDS who can develop central nervous system, gastrointestinal tract, pulmonary, and ophthalmic infections (AIDS Education and Training Centers [AETC], 2013).

The Problem

CMV infection occurs in 40% to 60% of all sexually active individuals in the United States and other developed countries, while resource-poor countries have an 80% to 90% prevalence rate (AETC, 2013). Cytomegalovirus retinitis (CMVR) accounts for 75% to 85% of these CMV infections (Teoh, Wang & Wong, 2012). Prior to the advent of antiretroviral therapy (ART), about 25% to 40% of patients with HIV/AIDS in the United States developed CMVR; the incidence in the United States and other developed countries has decreased tremendously since then (Teoh et al., 2012). In the low to middle income countries of Africa and Southeast Asia, CMVR remains the most common opportunistic eye infection, even in this era of ART (Ford, Shubber, Saranchuk, Pathai, & Heiden, 2013). Although patients with HIV/AIDS in developed countries may have easier access to ART than patients in the resource-poor countries, CMVR remains the most common cause of ocular morbidity and blindness globally (Lai, Wong, Luk, Chow, & Lam, 2011). CMVR has not received much attention from non-ophthalmology clinicians, which may partly be due to its perceived complex screening, diagnosis, and treatment (Heiden & Saranchuk, 2011). However, regular screening for CMVR among these patients is needed to diagnose the condition early, initiate prompt treatment, and make timely referral to halt progression of the disease, preserve the remaining vision, and save the contralateral eye from destructive infection (Lai et al., 2011).

Evidence of the Problem

Ford and colleagues (2013) conducted a systematic review and meta-analysis of 65 academic journal articles and found CMVR's pooled prevalence rate to be 14%; 31.6% of these patients reported visual loss in one or both eyes at the time when CMVR diagnosis was established. Studies done in South Africa, South India, Southeast China, Eastern China, Hong Kong, Singapore, Korea, Japan, Thailand, and Myanmar corroborated the same findings of CMVR being the most common HIV/AIDS opportunistic eye infection in this era of ART (Ganekal, Jhanji, Dorairaj, & Nagarajappa, 2012; Heiden & Saranchuk, 2011; Kim, Park, Yu, Kim, Jang, & Oh, 2012; Lai et al., 2011; Pathai, Gilbert, Weiss, McNally, & Lawn, 2011; Shi, Lu, He, Yang, & Zhang, 2011; Teoh et al., 2012; Tun, London, Kyaw, Smithuis, & Heiden, 2011). A CD4 count of less than 100 cells/µL is an important predictor of occurrence of CMVR morbidity among patients with HIV/AIDS (Ganekal et al., 2012; Lai et al., 2011; Shi et al., 2011).

Patients presenting in clinical stages 3 and 4 of the World Health Organization Clinical Staging and Clinical Disease Classification Systems (World Health Organization, 2007) have higher CMVR morbidity (Ganekal et al., 2012). CMVR lesions located in zone 1, which corresponds to the area within 3000 µm of the fovea or within 1500 µm of the optic nerve, are associated with sudden reductions in visual acuity, while zone 2, which corresponds to area outside zone 1 to the vortex vein ampullae at the equator, and zone 3, which represents the area outside zone 2 to the ora serrata, are highly associated with retinal detachments (Ahuja, Couch, Razonable, & Bakri, 2008).

Many authors have made recommendations to perform routine retinal screening among HIV/AIDS patients to detect CMVR and decrease its ocular morbidity (Ford et al., 2013; Ganekal et al., 2012; Geng et al., 2011; Heiden & Saranchuk, 2011; Lai et al., 2011; Wang et al., 2011). The recommendations include strict monitoring of CMVR on ART for CMVR reactivation; immune reactive uveitis (IRU) phenomena (Heiden & Saranchuk, 2011); and size and activity of CMVR lesions to assess response to treatment and to change therapy if treatment failure is detected (AETC, 2013). The Myanmar CMVR screening and treatment model suggests a strategy to diagnose and manage CMVR at the primary care level (Tun et al., 2011). Tun and colleagues (2011) trained 17 primary care HIV/AIDS clinicians to perform dilated retinal examination using indirect ophthalmoscopes to diagnose...
CMV retinitis, and 8 received additional training on administering intravitreal injections. The utilization of telemedicine to screen and diagnose CMVR through digital fundus photographs of patients with HIV/AIDS who lack access to specialty ophthalmology care has been started in rural areas of Singapore and Thailand (Ausayakhun, Skalet, Jirawison, Ausayakhun, & Margolis, 2011; Shah, Leo, Pan, Yong, & Teoh, 2013).

Another important diagnostic use of retinal screening is to demonstrate CMV end-organ disease. Positive laboratory results for the presence of CMV in urine, saliva, semen, cervical secretion, broncho-alveolar lavage fluid and blood do not indicate active CMV disease. Serologic tests are not reliable either because most adults are seropositive for CMV (Ahuja et al., 2008; AETC, 2013). CMVR is an end-organ disease and is usually a manifestation of CMV viremia. Therefore patients with HIV/AIDS having neurologic, gastrointestinal, or pulmonary CMV disease should undergo retinal screening to detect subclinical retinitis because oftentimes CMVR is the initial clinical manifestation of CMV systemic diseases (Ahuja et al., 2008; AETC, 2013).

**The CMVR Clinical Practice Guideline**

**Screening for CMVR**

The screening for CMVR starts with an extensive review of a patient’s personal medical history and acquisition of subjective and objective data. Patients with HIV/AIDS are clinically staged according to WHO Clinical Staging of HIV/AIDS (Ganekal et al., 2012). Important information to review in the history include the chief complaint recorded in patient’s own words; associated signs, symptoms, and their duration; date when HIV infection was confirmed; specific ART medications; CD4 (this laboratory tests corresponds with the number of T Lymphocytes in the blood which help fight infection and in the HIV/AIDS patient and is used to determine the stage of their illness) and HIV RNA responses; CMV or CMVR infection; ART or anti-CMV medication reactions; and most recent CD4 count (AETC, 2013; Altaweel, 2012). Past ocular history should include the dates of the patient’s last vision and dilated retinal examinations. The eye examination to screen for CMVR focuses on visual acuity, visual fields, pupillary size and reactivity, and slit-lamp and funduscopic examinations (AETC, 2013; Dalal, Chaudhari, Shah, Patel, & Ghandi, 2013).

Visual acuity measures the function of the retina. Distance visual acuity is assessed using the Snellen chart (Dalal et al., 2013). Other charts for distant vision screening include HOTV eye chart, LEA symbols, illiterate E, or Allen figures. Near visual acuity is measured using Rosenbaum or Jaeger pocket chart (American Optometric Association [AOA], 2011). Visual field examination screens defects in visual fields. Confrontation technique is a simple screening test that assesses all four visual field quadrants to detect large scotomas (AOA, 2011). Bowl perimetry more accurately quantifies, maps, and monitors the visual field defects (Kozak, Ahuja, Gangaputra, Van, & Freeman, 2012). Patients are advised to perform a self-test daily to detect central vision changes by looking at the Amsler grid chart at 12-14 inches away, testing each eye separately (AOA, 2011). Peripheral visual field defects may signify zones 2 and 3 retinal lesions, while decreased visual acuity and central field defects pinpoint to zone 1 lesions, which are immediately sight-threatening (Ahuja et al., 2008). Checking the reactions of the pupils to a swinging light test may reveal relative afferent pupillary defect (RAPD), which may suggest that the decrease in visual acuity may be due to extensive CMVR damage (Charters, 2010). The slit-lamp examination visualizes corneal endothelial changes, anterior chamber cells, synchiae, vitreous floaters, and other signs of anterior uveitis or anterior vitritis due to immune recovery uveitis (IRU) or immune recovery vitritis (IRV) (Abdollahi, Mohraz, Rasoulinedad, Shariati, & Soori, 2013; Tim et al., 2011). Indirect ophthalmoscopy using Heine indirect ophthalmoscope with +20D lens and slit-lamp examination with +90 lens evaluate the fundus to find signs of retinitis (Abdollahi et al., 2013; Dalal et al., 2013). The optical coherence tomography (OCT) and scanning laser polarimetric studies (SLPS) are able to demonstrate nerve fiber layer damage, which is known to precede HIV-associated neuroretinal disorder (NRD) (Kozak et al., 2012).

**Diagnosing CMVR**

CMV may be asymptomatic, or patients may present with subjective complaints of decreased vision, floaters, scotomata, or other visual field defects. The gold standard for diagnosing CMVR is by funduscopic examination through indirect ophthalmoscopy performed by an ophthalmologist (AETC, 2013; Pathai et al., 2011). Yellow-white retinal lesions, described as “cottage cheese in ketchup” retinal lesions, which represent vascular hemorrhages and exudates, are pathognomonic of CMVR (AETC, 2013). Diagnosis through funduscopy has a 95% positive predictive value (National Institute of Health [NIH], 2013). Due to the lack of ophthalmic specialists in rural clinics, fundus examination has been done using digital fundus imagery and software programs to diagnose CMVR through teleophthalmology programs (Chen, Ausayakhun, Jirawison, Khouri, & Margolis, 2011; Temprano, Homa, & Tang, 2002). Teleophthalmology has also been utilized in developing countries for consultant referrals to establish the diagnosis of CMVR in patients with HIV/AIDS who lack access to ophthalmic specialty care (Ausayakhun et al, 2011; Shah et al., 2013).

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When diagnosis is not possible via funduscopy or fundus photography, a quantitative polymerase chain reaction (PCR) assay of anterior chamber aqueous or vitreous humor specimen for CMV may be utilized as a diagnostic procedure (Hirsch, Lautenschlager, Pinsky, Cardenoso, Vilchez, & Valsamakis, 2013; Matos, Muccioli, Belfort, & Rizzo, 2007). CMV PCR is best utilized to include CMV in a differential diagnosis among patients with HIV/AIDS (Brantsaeter, Holberg-Petersen, Jeansson, Goplen, & Bruun, 2007). In the presence of cataracts, opaque corneas, and other conditions that may obscure the funduscopic examination, PCR of the aqueous or vitreous humor for CMV can diagnose CMVR in 80% of cases (NIH, 2013). Quantitative PCR is recommended as a diagnostic tool to screen CMV disease among high-risk graft-versus-host disease patients (Ksouri, Eljed, Greco, Lakhal, & Hassen, 2007).

Referring CMVR
Immediate referral to ophthalmologists and infectious disease specialists is recommended once the CMVR diagnosis is established (Jabs, Ahuja, Natta, Srivastava, & Gangaputra, 2010; Ford et al., 2013). The location of CMV retinal lesions corresponds to the degree of visual impairment and risk for sight-threatening complications. Retinal detachment, intraocular hemorrhage, uveitis, and optic nerve atrophy comprise 39% of CMVR sight-threatening complications (Dalal et al., 2013).

The referral action must at least include CD4 count, patient’s stage according to WHO Clinical Staging of HIV/AIDS, visual acuity, fundus photographs, PCR and other laboratory results (Chen et al., 2011; Ganekal et al, 2012; Jabs et al., 2010), and classification of the patient with CMVR from one of these three categories: (1) newly diagnosed CMVR (diagnosed within 45 days), (2) previously diagnosed CMVR with immune compromise, and (3) previously diagnosed CMVR with immune recovery (CD4 count ≥100 cells/µL) (Jabs et al., 2010). Screening and monitoring of patients with CD4 counts of less than 50 cells/µL were recommended every 1 to 3 months because these patients have a 35% chance of developing CMV retinitis within 13 months, while patients with CD4 counts of 50-100 cells/µL and those whose counts are greater than 100 cells/µL should undergo screening and monitoring every 3 to 6 months and every 6 months to 1 year, respectively (Altaweel, 2012).

Treating CMVR
The national resource centers AETC (2013) and AIDS Info (2013) and authors Ahuja and colleagues (2008) and Altaweel (2012) recommended individualized treatment of CMVR based on the severity and location of the retinal lesion and the CD4 count. The authors also recommended concomitant ART treatment to patients with CD4 counts of less than 100 cells/µL. The anti-CMV treatment consists of initial or induction therapy and maintenance or chronic maintenance therapy.

Anti-CMV Initial or Induction Therapy

Sight-threatening CMVR

Preferred treatment.
(1) Foscarnet 2.4-mg intravitreal injection for 1–4 doses over 7–10 days, and
(2) Valganciclovir 900 mg taken orally twice daily for 14-21 days, then once daily.

Alternative treatment.
(1) Foscarnet 60 mg/kg intravenously every 8 hours or 90 mg/kg intravenously every 12 hours for 14-21 days, then 90-120 mg/kg intravenously daily, or
(2) Cidofovir 5 mg/kg intravenously once a week for 2 weeks, then 5 mg/kg every other week (AETC, 2013; Ahuja et al., 2008; AIDS Info, 2013; Altaweel, 2012).

Non-sight threatening CMVR
(1) Valganciclovir 900 mg PO twice daily for 14-21 days, then once daily, or
(2) Foscarnet 60 mg/kg intravenously every 8 hours or 90 mg/kg intravenously every 12 hours for 14-21 days, then 90-120 mg/kg intravenously daily, for patients who cannot tolerate oral valganciclovir or have been resistant to valganciclovir (AETC, 2013; Ahuja et al., 2008; AIDS Info, 2013; Altaweel, 2012).

Anti-CMV Maintenance or Chronic Maintenance Therapy
Monthly monitoring is recommended for patients with CD4 counts of less than 100 cells/µL who are on maintenance therapy. Fundus pictures and laboratory studies for drug toxicity levels are compared and monitored.
FIGURE 1
Algorithm for Screening and Diagnosing CMVR

Patients with HIV/AIDS Presenting to Clinics

- Visual Field Defect Tests
  - Confrontation Visual Field Test
  - Amsler Grid
  - Humphrey Goldman
  - Scotoma

- CMVR Zone 1&/2
- CMVR Macular Epiretinal Membrane
- Refer

- CMVR Retinal Detachment

- Slit-lamp Examination
  - Cornea
  - Anterior Chamber
  - Iris and Lens
  - Anterior Vitreous
  - Cells
  - Synechiae
  - WBC
  - RBC
  - Immune Reconstruction Uveitis
  - Immune Reconstruction Vitritis
  - Refer

- Retinal Tear Retinal Detachment

- Cotton-Wool Spots
- Yellow-White Retinal Lesions
- "Cottage Cheese in Ketchup"

- Difficulty Viewing Fundus

- Intraocular Hemorrhage
- Retinal Detachment
- Cataract
- Opaque Cornea

With Other Retinal Finding
- Perivascular
- Retinal Veins
- Diabetic Retinopathy

No Other Retinal Finding
- Aids CMVR Other Infection
- Retinal Arteries
- Epiretinal Membrane
- Hypertensive Retinopathy
- PCR Assay of Aqueous Humor Vitreous Humor

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**Treatment**

(1) Valganciclovir 900 mg PO daily, or

(2) Foscarnet 90-120 mg/kg intravenously once daily, or

(3) Cidofovir 5 mg/kg intravenously every other week (AETC, 2013; Ahuja et al., 2008; AIDS Info, 2013; Altaweel, 2012).

Patients with CD4 counts greater than 100 cells/µL and inactive CMV retinitis for 3 to 6 months may discontinue the maintenance therapy and follow up with ophthalmic providers every 3 months for detection of IRU or relapse. Patients with CD4 counts of <100 cells/µL need indefinite anti-CMV chronic maintenance therapy and monitoring (AETC, 2013; Ahuja et al., 2008; AIDS Info, 2013; Altaweel, 2012).

**Monitoring CMVR**

Monitoring of CMVR is warranted because visual changes may occur for several reasons: CMV retinitis progression due to a new retinal lesion or expansion of the recent retinal lesion; retinal detachment; or IRU (AETC, 2013; Heiden & Saranchuk, 2011; Jabs, Ahuha, Van, Dunn, & Yeh, 2013). Immune reconstitution inflammatory syndrome (IRIS), which can manifest as IRU or IRV, typically occurs during the initiation of ART therapy, especially in patients whose CD4 counts are below 100 cells/µL because of either delayed restoration of CMV-specific immunity (AETC, 2013; Heiden & Saranchuk, 2011). IRU complication causes significant loss of vision through the development of macular edema or epiretinal membrane formation. Retinal lesions in CMVR are monitored via fundus photographs documenting its progression and resolution after therapy induction, one month after initiation of therapy, and every month during anti-CMV therapy to assess response to treatment and to change therapy if treatment failure is detected (AETC, 2013; Ford et al., 2013). About 50% to 60% of patients may develop retinal detachment in the first year following their CMVR diagnosis (Ford et al., 2013).

The recommended schedule for CMVR monitoring utilizing funduscopys and teleophthalmologic examination every 3 months (AETC, 2013; Jacobsen & Sifontis, 2010). The scheduled funduscopic examination or teleophthalmologic conference should include ocular monitoring for cidofovir-related anterior uveitis/iritis, hypotony, retinal detachment, or intraocular injection-related bacterial or fungal infections, and intraocular hemorrhage (Jacobsen & Sifontis, 2010).

Hematologic tests are ordered to screen for valganciclovir-related anemia, thrombocytopenia, neutropenia, and renal electrolyte imbalances (ATEC, 2013). Complete blood count (CBC), serum electrolyte and renal panel are monitored twice a week during induction and weekly during maintenance therapy (AETC, 2013; Segarra-Newnham & Salazar, 2002). Blood urea nitrogen (BUN), creatinine, and urinalysis are required prior to infusion of cidofovir to monitor dose-related irreversible nephrotoxicity of the drug (Segarra-Newnham & Salazar, 2002).

AETC (2013) recommends reinduction and reinstitution of the same anti-CMV therapy used in the maintenance therapy if CMVR relapse occurs. A shift of treatment from valganciclovir to foscarnet is recommended for CMVR relapse due to drug resistance (AETC, 2013; Butler & Thorne, 2014; Komatsu, Pikis, Naeger, & Harrington, 2014). PCR and point mutation assays are recommended to detect the CMV UL97 mutation that is responsible for the drug resistance (Butler & Thorne, 2014; Komatsu et al., 2014). Researchers believe that low-level CMV resistance may respond to cidofovir, while high-level CMV resistance needs foscarnet therapy (AETC, 2013; Butler & Thorne, 2014; Komatsu et al., 2014).

Moreover, monitoring is essential during chronic maintenance therapy until the CD4 count is greater than 100 cells/µL. Patients with HIV/AIDS whose CD4 counts are greater than 100 cells/µL for 3 to 6 months may discontinue the anti-CMV therapy (Butler & Thorne, 2014); otherwise, the chronic maintenance therapy is advised and monitored for life (Holbrook, Colvin, Natta, Thorne, & Jabs, 2011). Funduscopys or teleophthalmology is performed every 3 months once the chronic maintenance therapy is discontinued, and every year once immune reconstitution is attained (Butler & Thorne, 2014; Holbrook et al., 2011). If CD4 counts go below 100 cells/µL again, a secondary prophylaxis will be reinstituted (AETC, 2013; Butler & Thorne, 2014; Jabs et al., 2013).
FIGURE 2
Algorithm for Referring and Monitoring for CMVR

Newly-Diagnosed CMVR

Previously-Diagnosed CMVR
With Immune Compromise

Previously-Diagnosed CMVR
With Immune Recovery

CD4 Count

Retinal Zones

<50 Cells/Microliter

>100 Cells/Microliter

Zones 2 & 3

Zone 1

Decreased Visual Acuity

Stable Retinal Lesions

Decreased Visual Acuity

CD4 <50 continue anti-CMV Treatment, Monitor Every 1 Month

CD4 50–100 continue anti-CMV Treatment, Monitor Every 3 Months

CD4 >100 for 3–6 Months, Discontinue Anti-CMV, Monitor Every 3 Months, Then Every Year if Immune Recovery Persists

New Retinal Lesions, Expansion of Retinal Lesion Border, Retinal Detachment, Intra-ocular Hemorrhage, IRU

REFER to Ophthalmologist Infections Specialist

Surgical Intervention

Medical Treatment

MONITOR via Fundus Photographs Tele-Ophthalmology

Fundus Photographs Tele-Ophthalmology

2 Weeks After Initiation of Anti-CMV Treatment

Every Month During Anti-CMV Maintenance

Relapse

PCR Assay for CMV DNA

Sequencing for CMV UL97 Mutation

Monitor Every 3 Months

Re-induction

Low-Level Resistance

High-Level Resistance

Cidofovir

Foscarnet

Treatment Complications: Uveitis, Globe Hypotony, Retinal Detachment, Intra-ocular Injection-Related Bacterial or Fungal Infection and Hemorrhage

Laboratory Levels: CBC, Serum Electrolytes, Renal Panel, BUN, Creatine, Urinalysis

Twice a Week During Induction

Every Week During Maintenance Therapy

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For pregnant women with CMVR, the screening, diagnosing, referring, and monitoring processes remain the same because the indications for management are similar. However, valganciclovir is the drug of choice for pregnant women with CMVR. The treatment varies only during the first trimester, when valganciclovir intravitreal injection alone is recommended (AETC, 2013; Aluja et al., 2008; AIDS Info, 2013; Altaweel, 2012). And oral valganciclovir is added only after the first trimester when indicated. (AETC, 2013; Aluja et al., 2008; AIDS Info, 2013; Altaweel, 2012).

Summary and Conclusions
This clinical practice guideline optimizes care of patients with CMVR by outlining the steps for screening, diagnosing, referring, and monitoring of CMVR based on a systematic review of evidence and assessment of the current care options. This information enables clinicians to proceed accordingly through the steps of the standard of care for each type of CMVR patient—newly diagnosed CMVR, previously diagnosed CMVR with immune compromise, and previously diagnosed CMVR with immune recovery—who presents with specific ocular signs, symptoms, and other clinical manifestations of CMVR, CD4 count and other laboratory results, and current medications. It is expected that implementation of the clinical practice guideline will result in improved clinician decision making that shall potentially save the patient’s vision and prevent further ocular damage. It is anticipated that the clinical practice guideline will improve the quality of care of patients with CMVR and enhance their outcomes.

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<th>CE tests for ASORN Insight Continuing Education activities are available online for a fee! To take the test for this activity and earn continuing education credits, visit <a href="http://www.EyeCareCE.org">www.EyeCareCE.org</a>.</th>
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Browse EyeCareCE courses by profession (nurse, technician, etc) or by keyword. Once you’ve found a course you want to take, add it to your cart.

**Login Instructions**

Login will be required to checkout.

- If you were ever an ASORN member before July 1, 2014 your username is the email address* you have on file with ASORN and your password is your first initial last name, all lower case, no spaces.
- If you joined ASORN after July 1, 2014 your username is the email address* you have on file with ASORN and your password is “ASORNuserid” (example: ASORN34562).
- If you’re not an ASORN member and have never used EyeCareCE before, you will Create a New Account.

Trouble logging in? Contact JCAHPO (800) 284-3937.

Course materials will be available after checkout (the article, followed by an evaluation, then the post-test). Test results are revealed immediately upon completion of the post-test. If the test is passed you should immediately retrieve and print your certificate of credits. This will be your official transcript of credits from the course. If the test is not passed, an opportunity to try again is offered.

**Successful Completion:**

Review the post-test questions and practice before you login to take the test. Successful completion of this activity includes: purchasing the course, reading the article, completing the evaluation, taking the online post-test, and achieving a passing rate of 80% or higher. This activity has an expiration date that is stated in the course description listed on EyeCareCE. This post-test may not be available immediately. An email will be sent when the test is posted on www.EyeCareCE.org.

*If you are an ASORN member but do not have an email address on file with ASORN you will not have an EyeCareCE login. Please contact ASORN.

**POST-TEST QUESTIONS**

<table>
<thead>
<tr>
<th>1. Global infection of CMVR is found in approximately what percent of the 34 million patients with HIV/AIDS?</th>
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<tbody>
<tr>
<td>A. 70%</td>
</tr>
<tr>
<td>B. 50%</td>
</tr>
<tr>
<td>C. 20%</td>
</tr>
<tr>
<td>D. 90%</td>
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<table>
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<tr>
<th>2. The most common ocular complication that results in partial or total blindness is</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Retinal detachment</td>
</tr>
<tr>
<td>B. Cytomegalovirus Retinitis</td>
</tr>
<tr>
<td>C. Endophthalmitis</td>
</tr>
<tr>
<td>D. Retinoschisis</td>
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<tr>
<th>3. CMV infection occurs in what % percent of all individuals who are sexually active?</th>
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<tbody>
<tr>
<td>A. 1–25</td>
</tr>
<tr>
<td>B. 30–40</td>
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<tr>
<td>C. 40–60</td>
</tr>
<tr>
<td>D. 25–40</td>
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</tbody>
</table>

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<tr>
<th>4. Eye examination focuses on</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Visual acuity</td>
</tr>
<tr>
<td>B. Goldmann visual fields</td>
</tr>
<tr>
<td>C. Fundus exam</td>
</tr>
<tr>
<td>D. All of the above</td>
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<tr>
<th>5. Near vision is measured using</th>
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<tbody>
<tr>
<td>A. Jaeger pocket chart</td>
</tr>
<tr>
<td>B. Rosenbaum pocket chart</td>
</tr>
<tr>
<td>C. Both A &amp; B</td>
</tr>
<tr>
<td>D. None of the above</td>
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<tr>
<th>6. The gold standard for diagnosis is</th>
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<tbody>
<tr>
<td>A. Visual fields</td>
</tr>
<tr>
<td>B. Direct ophthalmoscopy</td>
</tr>
<tr>
<td>C. Indirect ophthalmoscopy</td>
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<tr>
<td>D. Tonometry</td>
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<tr>
<th>7. Screening and monitoring of patients with CD4 counts of less than 50 cell/microliter are recommended every</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 1–3 months</td>
</tr>
<tr>
<td>B. 2–4 months</td>
</tr>
<tr>
<td>C. 4–6 months</td>
</tr>
<tr>
<td>D. Weekly</td>
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<tr>
<th>8. The national resource centers of AETC (2013) recommend individualized treatment based on</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Severity of retinal lesion or retinitis</td>
</tr>
<tr>
<td>B. Location of retinal lesions</td>
</tr>
<tr>
<td>C. CD4 count</td>
</tr>
<tr>
<td>D. All of the above</td>
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</tbody>
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<tr>
<th>9. Retinal lesions are monitored by</th>
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<tbody>
<tr>
<td>A. Fundus photos</td>
</tr>
<tr>
<td>B. OCT</td>
</tr>
<tr>
<td>C. Fundus Fluorescein angiography</td>
</tr>
<tr>
<td>D. ICG angiography</td>
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<tr>
<th>10. Which hematologic tests may be ordered during induction and maintenance CMVR treatment</th>
</tr>
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<tbody>
<tr>
<td>A. Liver panel</td>
</tr>
<tr>
<td>B. HgbA1C</td>
</tr>
<tr>
<td>C. CBC</td>
</tr>
<tr>
<td>D. ACE</td>
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ASORN members and other eye care professionals now have an online source for continuing education and training: EyeCareCE. The site is the collaborative effort of five organizations. Together, the Joint Commission on Allied Health Personnel in Ophthalmology (JCAHPO®), the American Society of Ophthalmic Registered Nurses (ASORN), the Association of Technical Personnel in Ophthalmology (ATPO), the Canadian Society of Ophthalmic Medical Personnel (CSOMP), and the Ophthalmic Photographer’s Society (OPS), teamed to produce a comprehensive online training resource for eye care professionals. ASORN is proud to participate in this online educational partnership.
We describe herein a registered nurse-led patient education program for patients with sight-threatening diabetic retinopathy (DR). The program utilizes a multidisciplinary team to develop a personalized health plan for each patient with the goal of improving the adherence of DR patients to all their diabetic-related medical appointments.

**Introduction**
Adhering to regular eye appointments is critical for patients with diabetes mellitus (DM) as it allows them access to vision-saving, evidence-based care for diabetic retinopathy. Timely DR treatment has been found to be 90% effective in preventing significant visual loss in patients with sight-threatening DR (Ferris, 1993). In addition, patients with sight-threatening DR are more likely to adhere to diabetes-related care appointments than are patients with less severe forms of or no DR (Lee, Feldman, Ostermann, Brown, & Sloan, 2003; Sloan, Brown, & Lee, 2004). However, having poor knowledge of diabetic ocular complications and recommended treatment is significantly associated with nonadherence to diabetes care appointments (Schoenfeld, Greene, Wu, & Leske, 2001), and patients with poor adherence to treatment are less likely to receive evidence-based care than are patients with good adherence to treatment (Grant et al., 2007).

Using this information as a starting point, we hypothesized that educating patients with sight-threatening DR about the causes, complications, and management of DR and its relationship to the overall care of their DM would improve adherence to eye and also other DM-related appointments. To this end, we developed a registered nurse (RN)-led education clinic at a New England Veterans Affairs (VA) Medical Center that seeks to (a) enroll patients in a rigorous DR educational program and (b) partner with their multidisciplinary team of providers to better integrate the care of these DR patients at our medical center.

**Goals**
The goals of this DR patient education program are three-fold:

- To increase patients’ engagement with the health-care system by formulating a personalized health-care plan based on shared goals between the patients and the health-care team
- To improve adherence with all DM-related medical appointments over a one-year period
- To lower the risk of visual loss from DR

**Enrollment**
The target population is patients with moderate to severe nonproliferative DR (NPDR), proliferative DR (PDR), and diabetic macular edema (DME). All veterans with these diagnoses registered in the eye clinic are considered for participation in this program. Enrolled patients come from searching pertinent ICD-9 DR codes from October 1, 2012, to November 21, 2013, as well as ophthalmology and optometry referrals. Patients are contacted by telephone and asked if they would like education regarding their DR. Every effort is made to coordinate the RN education appointments with a concomitant eye appointment. Family attendance and participation is encouraged.

*continued on the next page*
Patient-Centered Care for Diabetic Retinopathy: A Nursing Initiative for Patient Education

(Continued from page 15)

Needs Assessment
Prior to the commencement of an educational session, each patient is given an initial needs assessment. The RN assesses potential communicative, physical, emotional, cognitive, and cultural barriers to learning; if one or more barriers are present, an accommodation is documented and implemented. The tenets of Adult Learning Theory (Knowles, Swanson, & Holton, 2011) guide the RN educational program. This includes the need for adult learners to (a) be respected, (b) see the immediate usefulness of the learning, (c) have a safe learning environment, and (d) be engaged in their learning and make sure the learning is relevant to their lives.

Educational Tools
The educational session includes a digital slide presentation about the pathophysiology of DR and various treatment modalities, including anti-vascular endothelial growth factor (VEGF) and laser therapy (see Table 1). Videos, eye models, and written materials are available as needed. Videos are presented on 46-inch touchscreen monitors to help accommodate patients with severe visual impairment. Because many of our patients are hard of hearing, the educational videos are broadcast in surround sound to maximize audio delivery. If amplification needs are such that this would be disruptive to other patients in the clinic, earphones are provided. The eye clinic has six of these touchscreen monitors, accompanied by six sets of educational tools, located in various areas in the clinic. Strategic placement of the educational implements throughout the clinic is paramount, taking into consideration patient mobility issues as well as clinic flow. Written materials (presented at the eighth-grade level) reinforce points made during the educational session (Stossel, Segar, Gliatto, Fallar, & Karani, 2012). This material includes useful websites where additional reliable information can be obtained and toll-free numbers for patients without computer access. Ultimately, the educational tools chosen are based on the veterans’ preferred learning method.

Educational Process
The majority of the patient education is provided one-on-one in a private, relaxed, nonthreatening atmosphere that encourages open communication between patient and RN. At the initial session, barriers to success are ascertained and patient-centered goals defined. Emphasis is placed on exploring the patients’ vision of health and how best to advance them in that direction. Tailoring support to the patients’ level of engagement encourages them to actively participate in a shared vision for their health care. This includes adhering to their follow-up appointments so they can receive evidence-based care that will decrease their risk of blindness from DR and improve their DM management and overall health. Patients meet with the DR RN educator quarterly for a year, and then on an as needed basis. Educational points are reinforced as needed, and any upcoming treatment modalities are reviewed in detail to improve the informed consent process and the patient’s engagement in their eye health.

Collaboration
The eye clinic has forged a multidisciplinary partnership within our medical center to meet the varied and often complex needs of patients with vision-threatening DR. To provide a personalized health plan, patients are referred as needed to the metabolic pharmacists to improve chemical regulation, to the nutrition service for dietary education, and to the hospital diabetic nurse educator for further insight and resources. In addition, primary care is contacted about patients who have been lost to follow-up. Led by the eye RN, this coordinated effort helps patients navigate the labyrinth of services available to them and provides a familiar contact person should any questions or concerns arise along the way—all of which lays a foundation for a trusting and caring relationship.

Outcomes
In the short term, the efficacy of the education clinic is assessed by a patient satisfaction survey. After each educational session, patients are provided with a brief six-question satisfaction survey to complete anonymously. Patients have five response options, ranging from “outstanding” through “failed.” Patients are also asked if they would recommend the teaching to other veterans and if they left the teaching session with a better understanding of their eye disease or procedure. A free text area is provided for any additional

TABLE 1
Sample Patient Education Session

| 1. Initial patient needs assessment |
| 2. Digital slide presentation |
| • Staging, complications, and management of diabetic retinopathy |
| • Key signs and symptoms of diabetic retinopathy |
| • Trends in pertinent vital signs and laboratory values |
| 3. Use of supplemental materials as needed: videos, hands-on eye models, written materials |
| 4. Creation of personalized health plan including immediate, intermediate, and long-term goals |
| 5. Completion of anonymous patient satisfaction survey |
comments. Feedback received from the patients—both informally and as part of the anonymous surveys—allows the program to be continually modified, keeping it patient-centered and relevant. In the longer term, the efficacy of the clinic will be measured by comparing the adherence rates of enrolled DR patients to all their DM-related appointments against those of similar DR patients seen prior to the start of the RN education program.

**Conclusion**

In summary, this novel nursing educational initiative seeks to improve health outcomes for patients with vision-threatening DR by improving their adherence to all DM-related appointments. We hope it will become a useful patient educational program that can be replicated in other health-care settings both within and outside the U.S. Veterans Health Administration.

**References**


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Paul B. Greenberg, MD. Eye Clinic, Providence VA Medical Center, Providence, RI; Division of Ophthalmology, Alpert Medical School, Brown University, Providence, RI; Division of Ophthalmology, Rhode Island Hospital, RI

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**2014 EyeQ Webinar Series:**

**Bridging the Gap from Office to Surgery: 2014**

**10 is the New 9: ICDs and Their New Look**

Barbara Ann Harmer, RN, BSN, MHA
1 Nurse Contact Hour
Recording still available for CE.

**Bridging the Infection Control Gap in Ophthalmology**

Elethia Dean, RN, BSN, MBA, PhD
1 Nurse Contact Hour
Recording still available for CE.

**H&P for your ASC: Considerations for the Ophthalmic Patient**

Robert Welch, MSN, NP
1 Nurse Contact Hour
Recording still available for CE.

**Identifying and Managing Unhappy Patients**

Anne M. Menke, RN, PhD

**Tuesday, November 4, 2014 at 4:30pm PT / 7:30pm ET**

1 Nurse Contact Hour
Registration now open!
The International Council of Ophthalmology (ICO) has published updated ICO Guidelines for Diabetic Eye Care. The Guidelines provide recommendations for screening and evaluating people with diabetes for potentially blinding eye problems, and treating those with diabetic retinopathy and other ocular complications of diabetes.

“The original ICO Guidelines, released in December 2013, were a technical consensus by the ICO Task Force on Diabetic Eye Care, which resulted from their extensive review of diabetic eye care guidelines from around the world,” said Dr. Tien Y. Wong, Chair, ICO Committee on Diabetic Eye Care.

“The ICO Task Force on Diabetic Eye Care did a fantastic job creating a technical consensus. In January 2014, the taskforce was re-organized as the Diabetic Eye Care Committee. We updated the ICO Guidelines based on comments received during an online peer-review process and we added new, high quality images.”

Download the ICO Guidelines for Diabetic Eye Care from the ICO website at: www.icoph.org/DRGuidelines.html.

The ICO Guidelines are intended to serve a supportive and educational role for ophthalmologists worldwide, with the ultimate goal of improving the quality of eye care for patients with diabetes. They offer recommendations for screening, assessing, and treating diabetic retinopathy based on available resources. The ICO Guidelines are intended to be translated and adapted for local use by ophthalmologists and others who care for those with diabetes.

The recommendations are stratified in three levels:

- Essential or Core: for low resource settings
- Mid-Level: for intermediate-resource settings
- Current State-of-the-Art: for settings with abundant resources.

Diabetes is a growing global epidemic, affecting up to 30 percent of the population in some countries. Diabetic retinopathy, which is damage to the blood vessels in the back of the eye, is the leading cause of vision loss in working adult populations.

Patients with severe levels of diabetic retinopathy are reported to have poorer quality of life and reduced levels of physical, emotional, and social well-being, and they utilize more health care resources. Generally, about one in three persons with diabetes develops diabetic retinopathy, but all persons with diabetes are at risk for developing diabetic retinopathy.

Epidemiological studies and clinical trials have shown that optimal control of blood glucose, blood pressure, and blood lipids by those with diabetes can reduce the risk of developing retinopathy and slow its progression. Timely treatment with laser photocoagulation, and increasingly, the appropriate use of intraocular administration of vascular endothelial growth factor (VEGF) inhibitors can prevent almost all visual loss in vision-threatening retinopathy, particularly diabetic macular edema.

Since visual loss may not be present in the earlier stages of retinopathy, screening of persons with diabetes once a year is essential to enable early intervention and prevent blindness.

“Creating an international consensus on screening, assessing, and treating diabetic retinopathy is a major step towards
“Taking a resource-sensitive, adaptive approach to this worldwide issue is essential. The ICO Guidelines demonstrate the need for ophthalmologists to work with diabetologists, primary care providers, and others in the context of available clinical equipment, trained personnel, and resources.”

The ICO Guidelines are designed to be a working document and will be updated on an ongoing basis. Comments are welcome at info@icoph.org.

Translation and adaption for non-commercial use is encouraged, but please credit the ICO. PDF and Word versions are available on the ICO website. The 2013 version of the Guidelines is also available in Vietnamese: www.icoph.org/DRGuidelines.html.

The ICO Guidelines are part of an ICO initiative to work with ophthalmologic societies and other partners to reduce worldwide vision loss related to diabetes. Future committee priorities include:

- Incorporating the critical competencies for diabetic eye care into ICO curricula for ophthalmologists, subspecialists, and other eye health personnel and stimulating improved training and continuing professional development to meet public needs.
- Developing a framework for evaluation of public health approaches and stimulating development, strengthening, and monitoring of relevant health systems.

The International Council of Ophthalmology (ICO) represents and serves professional associations of ophthalmologists throughout the world. The ICO works with ophthalmologic societies and others to enhance ophthalmic education and improve access to the highest quality eye care in order to preserve and restore vision for the people of the world. For more information, see www.icoph.org.

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**INSIGHT – The Journal of the American Society of Ophthalmic Registered Nurses (ASORN)** welcomes and encourages manuscript submission. Manuscripts must not have been published before or be under consideration by other publications. Submissions should be pertinent to the specialty of ophthalmic practice, professional issues, or subjects related to ophthalmology.

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**Original articles, case studies, research articles, clinical technique, discussions, and letters to the editor are accepted.**

**Manuscript Submission.** Manuscripts should be submitted via email to the Editor in either a .doc or .docx file format.

**Manuscript Preparation.** Manuscripts should be typewritten using a 12-point Times New Roman font, double-spaced for 8½-by-11-inch paper, with one-inch margins. All pages should be double-spaced, including references and figure captions. A checklist for manuscript format is included below. Insight follows the style of the Publication Manual of the American Psychological Association (APA), 6th edition.

**Manuscript Format.**

1. Title page: Title of manuscript, authors’ name, degree(s), certifications, institutional affiliation, and professional positions. Give one complete mailing address, business phone number, home phone number, fax number, and email address. You may include a brief acknowledgment of grants or other assistance, if applicable.

The title page must also include disclosure of funding received for this work from any organizations.

2. Abstract: This page should show the manuscript’s title, but omit the authors’ names. The abstract may have 100 to 200 words, and it should summarize the purpose, relevance, and essential points of the manuscript. Research abstracts should summarize the research process and findings. No abbreviations, acronyms, footnotes, or references should be used.

3. Text: The first page of the text should use double space format and one-inch margins. Omit all authors’ names on text pages

4. Headings/subheadings: Organize information under headings and subheadings. Check the APA manual for heading and subheading format.

5. References: Begin the list of references on a new page. The style of references is found in the 6th edition of the APA. References used in the text are cited by author’s name and date of publication in parentheses; for instance: (Smith, 2000), with page numbers cited for direct quotations. All references cited in the text must be included on the reference list.

6. Figures: This includes photographs, illustrations, line drawings, graphs, and diagrams. Images should be provided in .eps or .tif format. Gray scale images should be at least 600 DPI, with a digital color proof. Gray scale images should be at least 600 DPI, combinations of gray scale and line art at least 1200 DPI, and line art (black or white color) at least 1.200 DPI. When using figures from another source, the author must obtain written permission from the original publisher.

7. Tables: Tables should be created double-spaced on a separate page.

**Checklist for Authors**

- Abstract (100-200 words).
- Title page (Include article title, author’s name, credentials, professional position, workplace, mailing address, home and work telephone numbers, fax number, and email address.)
- Article text (double-spaced throughout, one-inch margins, and headings)
- References (double-spaced, APA style)
- Authors are responsible for bibliographic accuracy and must check every reference in the manuscript and proofread again in page proofs.
- Tables, figures, illustrations, photographs
- Permission to reproduce previously published material or photographs
- Completed formstack submission via www.formstack.com/forms/1648097-WpEXEyLey
Lawsuits Related to Preoperative Evaluations

When plaintiffs sue for medical malpractice after eye surgery, experts review the entire process of care from diagnosis of the condition to management of postoperative problems. Sometimes, claims that initially appear to be about the outcome of a surgical procedure ultimately hinge on care provided well before the surgery. This issue of the Digest will examine allegations of negligent preoperative evaluation, specifically, medical preoperative decision-making.

Surgery and anesthesia induce a stress response that can cause cardiovascular and respiratory complications during and after surgery and exacerbate preexisting medical conditions such as heart disease and renal failure. Therefore, it is customary for patients to be screened and treated, whenever possible, for conditions that increase their risk for surgery. Lawsuits related to medical decision-making prior to surgery focus on the quality of the preoperative history and physical examination (H&P), the effectiveness of treatment of medical conditions to optimize the patient’s condition, and the adequacy of the informed consent discussion. These claims arise against ophthalmologists, primary care physicians, medical specialists such as cardiologists and hematologists, and anesthesia providers.

**Preop History and Physical Exam**

Hospitals and surgery centers that provide care for patients on Medicare and Medicaid must comply with conditions of participation (CoP) established by the Centers for Medicare and Medicaid (CMS). The CoP mandate that patients have a history and physical examination (H&P) at most 30 days prior to surgery, with an update on the day of surgery, as well as a preanesthesia evaluation. A number of lawsuits filed by patients who suffered serious medical problems in the perioperative period allege that the preoperative H&P was inadequate and raise questions about who may perform the exam, as the following case study shows.

A 41-year-old female patient with proliferative diabetic retinopathy needed vitrectomy surgery to repair a superior tractional retinal detachment. In addition to diabetes, the patient reported a history of hypertension and renal insufficiency, so the ophthalmologist asked the patient’s primary care physician to evaluate her for surgery. The patient had been hospitalized one week prior to surgery for uncontrolled diabetes and renal insufficiency. The PCP felt that additional tests were not necessary and that the patient could undergo surgery with an anesthesiologist providing general anesthesia. Soon after induction, the patient developed bradycardia. It responded to treatment, so the surgery resumed. When the patient developed a second episode of bradycardia 20 minutes later, the anesthesiologist asked the surgeon to stop the procedure. The patient was unresponsive in the post-anesthesia care unit and never regained consciousness. Diagnosed with anoxic brain injury, she died three months later.

The ophthalmologist, PCP, and anesthesia provider were all sued. Defense experts for the ophthalmologist supported the physician’s care, opining that he had correctly asked the patient’s PCP to determine the safety of the planned surgery and anesthesia and had no role in the anesthesia care. The PCP was similarly supported by his defense experts. Both plaintiff and defense experts, however, criticized the anesthesiologist, indicating that he had not adequately addressed the preoperative anemia from renal insufficiency, which predisposed the patient to hypoxia, and did not properly manage the bradycardia and hypoxia when they developed. Both the eye MD and PCP were dismissed from the lawsuit, while the anesthesiologist settled for a confidential amount. The outcome of this claim is consistent with other lawsuits related to anesthesia complications: while the ophthalmologist’s care will be carefully scrutinized, eye surgeons are generally not held liable for the care of anesthesiologists and Certified Registered Nurse Anesthetists (http://www.omic.com/omic-digest-archives-2004).²

**Is a Consultation Needed?**

The ophthalmologist in the previous case recognized that the patient had significant medical comorbidities and appropriately asked the patient’s PCP to evaluate her readiness for surgery. While the consultation did not prevent a lawsuit, it did
help get him dismissed from the claim. In contrast, the eye surgeon in the case presented in the Closed Claim Study was aware that the patient was on dual-therapy anticoagulation but did not seek input from the physician who had prescribed the medications. The defendant ophthalmologist had performed vitrectomy surgery without incident on many other patients on anticoagulants, so he did not anticipate problems with this one. This claim raises important questions. May an ophthalmologist perform the preoperative evaluation? If so, what are the patient safety and liability risks? And, prior to surgery, is the ophthalmologist required to consult with the physician who prescribed anticoagulants?

As a general rule, physicians may use any and all means to diagnose and treat a patient. Accordingly, performing a preoperative history and physical exam is certainly within the scope of practice of an ophthalmologist, and OMIC’s professional liability policy provides coverage for this exposure (see the Hotline article for more advice on conducting and delegating these exams). Malpractice lawsuits related to preoperative evaluations will center not on the ophthalmologist’s scope of practice, but rather on the standard of care and whether the ophthalmologist adequately assessed the patient’s medical condition.

Revised recommendations from the American College of Cardiology/American Heart Association (hereafter referred to as the “Guidelines”), and a revised Practice Advisory for Preanesthesia Evaluation from the American Society of Anesthesiologists (hereafter referred to as the “Practice Advisory”) provide valuable input on the purpose and scope of the preoperative evaluation and on anticoagulants. Explicitly acknowledging that surgery and anesthesia pose risks for all patients, these documents clarify that physicians no longer provide “medical clearance” for surgery. Rather, their evaluation produces a risk profile—low, medium, or high—and recommendations on perioperative management that guide the entire treatment team. The risk assessment is based on both the type and invasiveness of the surgical procedure and the patient’s medical condition. The Guidelines clarify that in terms of procedural risk “. . . superficial and ophthalmologic procedures represent the lowest risk and are rarely associated with excess morbidity and mortality.” For most eye surgeries, therefore, the goal of the preoperative evaluation is to assess the perioperative risk posed by medical comorbidities. The Guidelines and Practice Advisory help clarify that these assessments have a limited purpose and scope. They are not intended to diagnose and treat all medical conditions, but rather to screen for conditions that need to be treated before or during surgery. The Guidelines acknowledge that these assessments are conducted by a variety of providers, including surgeons, and that a formal consultation may not be necessary if “sufficient information about the patient’s cardiovascular status is available, symptoms are stable, and further evaluation will not affect preoperative management.” The important question to ask then is when do ophthalmologists need input from PCPs and medical specialists in order to safely plan the surgery.

**Anticoagulants**

This issue’s Closed Claim Study raises this question in terms of anticoagulants. The Guidelines discuss antiplatelet therapy but not treatment with warfarin. They acknowledge that dual antiplatelet therapy with aspirin and clopidogrel does increase the patient’s risk of bleeding compared to aspirin alone. They clarify, however, that procedures with a low risk of bleeding may proceed despite dual therapy and that monotherapy with aspirin need not be discontinued prior to elective noncardiac surgery, for while the frequency of bleeding rises, the severity of the increased bleeding and mortality from it are not usually greater. The Practice Advisory includes an acknowledgement that anticoagulant medications and alternative therapies pose additional risk but does not make specific recommendations about them.

OMIC has handled a number of claims involving either hemorrhage and vision loss while the patient was anticoagulated, or heart attack and stroke when anticoagulants were discontinued. Expert testimony has varied considerably, depending upon the type of surgery, anesthesia, anticoagulants, and medical comorbidities. Similarly, discussions with OMIC consultants from many subspecialties about preoperative evaluations in preparation for this article revealed a wide range in how ophthalmologists conduct these assessments.

There is some agreement, however, on anticoagulants. Experts and consultants concur that it is important for the ophthalmologist to explore with the patient the reason anticoagulant medication has been prescribed and the relative risk of hemorrhage associated with the specific surgery. For some types of eye surgery, ophthalmologists consider the consequences of a thrombolic event to be a greater risk than the potential vision loss from hemorrhage and do not discontinue anticoagulants prior to most cataract or retinal procedures. If the preoperative evaluation indicates that the patient is at low risk and no changes to the current medical treatment are needed, the ophthalmologist may reasonably conclude that consultation with the PCP or medical specialist is not required. If anticoagulants will be continued, the ophthalmologist may need to change the surgical technique or choose an anesthesia with a lower risk of hemorrhage (e.g., topical or sub-Tenons instead of retrobulbar), as well as monitor

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*continued on the next page*
Lawsuits Related to Preoperative Evaluations

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conditions such as hypertension that increase the risk of hemorrhage.

Other types of eye surgery have a greater risk of hemorrhage, including corneal transplantation and glaucoma surgeries as well as eyelid and orbital procedures.6 Oculofacial plastic surgeons, for example, may elect to postpone elective surgery unless anticoagulants have been stopped. In this instance, since the ophthalmologist judges that the patient’s current medical treatment needs to be changed, he or she would be well-advised to consult with the physician who prescribed the medication for advice on whether the medication may be safely stopped and recommendations on how to stop and restart it. If the patient has self-prescribed aspirin or supplements that impact the clotting cascade, the ophthalmologist may, of course, advise the patient to stop taking the aspirin and supplements before procedures that pose a risk of hemorrhage.

Preoperative Testing

While there is some agreement on when to continue and stop anticoagulants, there is no clear consensus on the need for preoperative coagulation studies. Both the Guidelines and the Practice Advisory stress that routine preoperative tests are never indicated, with routine defined as a test ordered in the absence of a specific clinical indication or purpose.7 Rather, the Guidelines recommend only ordering tests if the result is likely to influence patient treatment, such as a change in the surgical procedure performed, medical management or monitoring during the perioperative period, or postponement of surgery until the medical condition can be stabilized. This position is consistent with the results of research conducted by the Agency for Healthcare Policy and Research and summarized in a statement from the American Academy of Ophthalmology’s (AAO’s) Quality of Care Secretariat, which showed no decrease in complications related to cataract surgery for patients who underwent routine preoperative tests.8 Standards of practice for anticoagulation in the perioperative period continue to evolve.9 One approach adopted by some eye surgery centers to assess the risk of hemorrhage in patients on warfarin is to test the INR on the day of surgery. Written policies indicate when the decision to proceed with surgery needs to be revisited by the surgeon and anesthesiologist. Ophthalmologists may want to query anesthesiology and primary care colleagues for input on what clotting studies, if any, should be done prior to eye surgery.

Risk Reduction Strategies

Ophthalmologists who determine that a consultation with the patient’s PCP is indicated need to inform the PCP of the intended procedure, its risk of hemorrhage, and type of anesthesia, and document all discussions. As part of the informed consent discussion with the patient, the surgeon should address the risks and benefits of whatever decision is made about anticoagulant use and carefully document the decision-making process, discussion, and plan. Policyholders may find it helpful to use a consent form with preoperative instructions for anticoagulants (go to http://www.omic.com/anticoagulant-consent/). The patient and surgical team need to be alerted to the decision and symptoms of embolic events or hemorrhage. Patients should be given clear, written instructions on how to manage anticoagulants, including stopping and restarting information if they are discontinued. Confirming that the patient has followed these instructions is an important safety step addressed in the ophthalmic-specific surgical checklist OMIC has developed in collaboration with the AAO and other organizations.

Malpractice claims related to preoperative evaluation occur regularly. Ophthalmologists may help prevent these claims by implementing risk management measures that include developing a careful differential diagnosis that confirms the need for surgery and rules out contraindications, consulting with primary care physicians when patients have significant medical comorbidities or need to discontinue anticoagulant medications, conducting thorough informed consent discussions, and providing instructions to the surgical team about known risks.

References


6. See Shore J and Menke AM. Hemorrhage Associated with Ophthalmic Procedures for risk management recommendations for addressing the risk of hemorrhage, including a detailed discussion of anticoagulants.


Anne M. Menke, RN, PhD. Risk Manager, OMIC, San Francisco, CA, amenke@OMIC.com
Blurred Vision: “Is my cancer growing?”

A 55-year-old female has a history of a choroidal melanoma of the left eye that was treated with proton beam radiation in 2007. The patient maintains annual follow-up with the office for imaging of the tumor and maintains a visual acuity of 20/25. She has enjoyed a favorable outcome, with tumor regression without metastasis for nearly five years, until recently when she reported her vision in the eye has became distorted centrally. Her vision has declined to 20/80. Her initial fears immediately turned to her history of cancer.

Here are the images you have for reference. Is her malignancy growing again? What do you think the doctors told her? Eye wonder what that is?

Robert Welch, MSN, FNP, CRNO, Family Nurse Practitioner, Nevada Retina Associates, Reno, NV
It’s Autumn, It Must Be Annual Meeting Time!

Hmmmm . . . what is new and exciting at the Annual Meeting you ask?

**New Location:** McCormick Convention Center, Chicago Illinois

**Free Transportation:** Shuttles from Chicago hotels

**New Format:** Two days, Friday, October 17 and Saturday, October 18. This allows a full day on Sunday, October 19 to explore the AAO exhibits and lectures, or attend other meetings.

Meet and gather with your peers in an environment that will intrigue, excite and engage. The Annual Meeting is about YOU and meeting your educational needs and interests. There will be so much to learn, see and do at the Annual Meeting. Refresh and renew, see you in Chicago!

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**Pam Opremcak, RN, MPA, LNC,** Annual Meeting Director, Practice Administrator, The Retina Group, Inc., Columbus, OH, pmijpm@aol.com

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**Schedule at a Glance**

**Friday, October 17**
- Registration opens at 7:00am
- Poster session
- Regulations, Medicare and OSHA
- Legislative Update
- Leadership: Where is the Future Taking Us?
- Identifying and Managing Unhappy Patients
- Edna Ashy Lecture—Sharecare
- Back to the Basics in Ophthalmology
- Corneal Surgery
- Cataract Surgery in Glaucoma Patients
- Care of the Diabetic Patient
- Femtosecond Laser Surgery

**Saturday, October 18**
- Registration opens at 7:00am
- ASORN Business Meeting (members only)
- Infection Control
- Instrument Care and Handling
- Complex Surgical Cases: The Combo Case
- Argus II Retinal Implant
- Keynote Speaker: ORBIS International Compassionate Care
- Roundtable Networking Session: IOL Folding
- Role of the Mid-level Practitioner
- Infection Control/Instrument Care
- Volunteer with ASORN
- Ask an Expert
  - Pharmacology
  - Emotional Impact of EHR on Healthcare Workers
  - Becoming Certified Registered Nurse in Ophthalmology (CRNO)
  - Infection Control/Regulations
  - Eyelid Lesions/Clinical Pearls
  - Ocular Therapeutics/Pharmacology
  - Ocular Trauma
  - Low Vision
- Game Show Jepoardeye
- Drawing to be a participant at the Dr. Oz show in New York City!
The First Step is Becoming Certified

I was recently chosen to be a member of the National Certifying Board of Ophthalmic Registered Nurses, (NCBORN). This is a distinguished honor which all began with becoming certified. This board meets quarterly either at national meetings, scheduled meetings or by conference calls. Members represent Certified Registered Nurses in Ophthalmology, CRNOS from across the country.

One of the goals of this board is to encourage and assist ophthalmic nurses to become certified. My personal goal is to help facilitate the growth of membership in ophthalmic nursing certification.

I first became an ophthalmic nurse at Massachusetts Eye and Ear Infirmary in 1984. I was encouraged to become a member of the American Society of Ophthalmic Registered Nurses by a colleague, Pat Ruggles. I remember attending ASORN meetings and “networking” with ophthalmic nurses from around the country. I use the word “networking” because this was encouraged by an ophthalmic nurse at my first ASORN meeting. She suggested that we have business cards made to share with each other and use each other as resource nurses in our clinical areas of expertise. Through the years I have found this to be an excellent reference tool. I have called on these colleagues to help problem solve many clinical, administrative and educational issues.

My friend Judi Colbert was one of the first nurses to take the exam to be a CRNO. We were so excited for her when she passed the exam. In 1994 I took the exam . . . and passed it! Back in those days we couldn’t maintain our certification with continuing education. It was required that we retake the exam after 5 years! I “went on strike” thinking, “I can’t do this again.” In 2004 my friends and colleagues told me that we were “in this together” to study and re-take the exam and that we did. We spent summer weekends studying and mentoring each other. We each took chapters in the Core Curriculum for Ophthalmic Nursing textbook and taught each other. We still laugh over a phrase that repeatedly came up every time we studied, “you know the answer to this, so stop thinking like a physician.” This was so true. When we stopped trying to read into the questions, we knew the answers. In the fall, three of us took the exam and . . . we all passed!!

One might say that it takes a commitment of time and money to become certified and this is true. The commitment is challenging but rewarding. Achieving certification provides nurses with the ability to increase their:

- professional growth
- career satisfaction
- peer and patient recognition
- salary potential
- credibility and competency

What are the rewards for becoming certified?

Knowledge
- Certification has been linked to better patient outcomes. This is due to increased knowledge resulting in a reduction in errors.
- Studying for certification teaches us to learn aspects of ophthalmology that may be unfamiliar to us. If one specializes in general ophthalmology, studying could enhance awareness of pediatrics, retina, neuro-ophthalmology, and other areas that physicians may refer out to other practices.
- Certification requires increased continuing education to understand current changes in ophthalmology and thereby enhances patient outcomes. Nurses will often attend ASORN meetings or local chapter seminars and conferences to obtain ophthalmic credits.

Professional and Personal Growth/Accomplishments
- Certification has become a basis for career advancement.
- Nurse Managers often choose a certified nurse over a candidate who is not certified when both have similar skills
  - Hiring authorities view certification as
    - a mark of excellence
    - a sign of commitment to your career
    - a sign that you are willing to “go the extra mile”

continued on the next page
The First Step Is Becoming Certified

Continued from page 25

• Certification creates more opportunities to network and participate in professional events such as expert panels, workshops, research and studies sponsored by professional organizations and becoming a NCBORN member.

• It provides patients and their families with validation that the nurse caring for them has demonstrated experience, knowledge and skills in their area of expertise.

• Certification validates a respected level of specialty knowledge. It offers highly motivated nurses personal satisfaction in their decisions and abilities.

To sum it up, certification is a commitment rewarded with ongoing validation of specialty experience, knowledge and skills. It provides both personal and professional satisfaction.

There are presently 171 CRNOs. NCBORN members continuously strive to provide changes to encourage nurses to prepare for certification. Recent and current revisions include:

• Updated certification handbook
• Updated study guide resources
• Essentials of Ophthalmic Nursing books 1–4
• Pretest examination
• Review and update of questions on the exam

If you are considering taking the exam, make the commitment! Preparation is key. Attend an ASORN meeting and network with other nurses interested in taking the exam. Reach out to other ophthalmic nurses in your area. You’ll be glad you did!

Jean McGeary, RN, BSN, CRNO, New England Eye Center, Boston, MA, jmcgeary@tuftsmedicalcenter.org

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BOARD HIGHLIGHTS

• All online educational offerings will be moving to EyeCareCE, formally ACTIONED.
• A third Regional Meeting in 2015 will be held in the Northeast.
• Completed agreement with EBSCO to offer Insight as part of their online database.
• Insight is now available to members in electronic format.
• Exploring ways to increase revenues since grant funding is down.
• Approved a new cover and format for the updated Standards of Ophthalmic Clinical Nursing Practice, which should be available by the Annual Meeting.
• Authorized funding for NCBORN item review and exam review sessions to update the Certification Exam.
• Approved prizes to be awarded at the Annual Meeting game show, JeopardEYE. First prize is the choice of an ASORN publication.
• Searching for a new Provider Unit Director. If interested, please contact the home office.
• ASORN is only 91 memberships short of our goal to reach 900 this year. Help us reach our goal!

Nancy Haskell, RN, ASORN Secretary-Treasurer, nhaskell@capcityasc.com

DID YOU KNOW?

Apples are considered one of the worlds healthiest foods. Maybe that is why the old adage “an apple a day keeps the doctor away” is still used today! At 95 calories, boasting 2–3 grams of fiber and a healthy dose of vitamin C in each apple, it is truly a snack worth grabbing. Recent research shows that apples contain polyphenols which function as powerful antioxidants. Additionally, apples have been show to help with blood sugar regulation, have anti-cancer effects, and anti-asthma benefits. So, the next time you are looking to satisfy your sweet tooth . . . consider choosing an apple.

EYE WONDER

The answer to this month’s EYE WONDER is Exudative Radiation Retinopathy!

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10 is the New 9, ICDs and their New Look
with Barbara Harmer, RN, BSN, MHA
Recorded February 25, 2014

Bridging the Infection Control Gap in Ophthalmology
with Elethia C. Dean, RN, BSN, MBA, PhD
Recorded May 6, 2014

H&P for Your ASC: Considerations for the Ophthalmic Patient
with Robert Welch, MSN, NP
Recorded July 9, 2014

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Glaucoma Progression Decreased by Half with Advances in Diagnosis and Treatment

A study published in *Journal of Ophthalmology* revealed that the probability of blindness due to glaucoma has decreased by nearly half since 1980. The researchers speculate that advances in diagnosis and therapy are the likely causes of the decrease, but blindness is still a true risk for a significant number of patients.

Investigators at the Mayo Clinic assessed long-term changes in the risk of progression to blindness and the population incidence of glaucoma-related blindness. They reviewed every incident case (N = 857) of open-angle glaucoma diagnosed from 1965 to 2009 in Olmsted County, Minnesota, to identify progression to blindness (defined as a visual acuity ≤20/200 or visual field constriction to ≤20°). The investigators used Kaplan-Meier analysis to estimate the cumulative probability of glaucoma-related blindness, and they calculated the population incidence of blindness within 10 years of diagnosis using U.S. Census data. The researchers compared rates for subjects diagnosed from 1965 through 1980 with rates for subjects diagnosed from 1981 through 2000.

According to the study, the 20-year probability and the population incidence of blindness due to open-angle glaucoma in at least one eye had decreased from 25.8% for patients diagnosed between 1965 and 1980 to 13.5% for those diagnosed between 1981 and 2000. The population incidence of blindness within 10 years of diagnosis also decreased, from 8.7 per 100,000 to 5.5 per 100,000 for those groups, respectively. Researchers found that 15% of the patients diagnosed in the more recent timeframe still went blind. Higher age at diagnosis was associated with an increased risk of progression to blindness (P < .001).

This study has demonstrated that the risk of developing blindness from glaucoma has dropped by about half over the past 40 years. The population incidence of blindness from glaucoma has also dropped by about half, suggesting that research to improve the understanding, diagnosis, and treatment of the disease has been highly successful in improving the lives not just of individual glaucoma patients but of entire populations.

However, nearly 14% of patients with newly diagnosed glaucoma can still be expected to go blind in at least one eye within 20 years.


Interleukin-35 (IL-35) May Protect Against Uveitis

According to researchers at the National Eye Institute, interleukin-35 (IL-35) suppresses ocular inflammation and reduces the severity of uveitis. Investigators used a mouse model to test whether or not IL-35 could suppress autoimmune uveitis. It was found that injections of IL-35 administered on the same day that uveitis was induced in mice helped to prevent uveitis. Furthermore, when IL-35 injections were performed as many as 10 days after the induction of uveitis, IL-35 suppressed the disease. The researchers also found that IL-35 turns antibody-producing B cells into regulatory B cells that produce more IL-35, generating a “chain reaction of calm.” Researchers claim that these findings raise the possibility of new therapies for uveitis and other autoimmune diseases.


FDA Approved Eylea Injection to Treat Diabetic Macular Edema

Regeneron announced that the FDA has approved Eylea (aflibercept) injection for the treatment of diabetic macular edema (DME). Clinical studies have shown that treatment with Eylea can help improve and maintain vision with every eight-week dosing after five initial monthly doses. Eylea is available as a single, 2-mg strength intravitreal injection for all approved indications. Eylea was approved in the United States for the treatment of wet AMD in 2011 and for the treatment of macular edema following central retinal vein occlusion (CRVO) in 2012.

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About ASORN: The American Society of Ophthalmic Registered Nurses (ASORN) was organized in 1976 to unite registered nurses committed to providing quality ophthalmic care. Since then, ASORN has become the most trusted provider of quality education for the ophthalmic team. ASORN’s mission is to foster excellence in ophthalmic patient care while supporting the ophthalmic team through individual development, education, and evidence-based practice.

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“HOW TO RESPECT LIFE AND FACE DEATH.” This concept was shown to Patty Ka Wai Leung, RN, CNS(Oph), CRNO, FHKAN(Surgery-Oph), FHKCSN(Oph), by a nurse from England while she was in nurses training. Through her interaction with patients and other professionals, Patty has come to know that life is a miracle in itself, and that a healthy, functioning body is not to be taken for granted.

Patty’s philosophies provide a strong basis for a career as a dedicated registered nurse. Her educational background is also impressive. She became licensed as a Registered Nurse in 1988 with the Nursing Board of Hong Kong and in 1990 with the Nurses and Midwives Board of New South Wales, Australia. Patty continued her education and in 1992 earned a Bachelor of Applied Science (Nursing) degree from the University of Sydney, Australia, and in 1996 a Master of Health Administration degree from the University of New South Wales, Australia. In 2005 she received a Master of Business Administration (Strategic Marketing) degree from the University of Hull, United Kingdom.

From the beginning of her nursing career, Patty’s goal was to be a specialty nurse. Following several years as an operating room nurse and a medical/surgical nurse, she began her pathway to becoming an ophthalmic nurse. Patty worked under Emeritus Professor Guy Hugh Chan of Temple University and participated in the establishment of the Refractive Surgery Center at the Hong Kong Sanatorium and Hospital in Hong Kong. Then in 1997, during the annual American Academy of Ophthalmology (AAO) meeting in San Francisco, Professor Chan introduced Patty to Heather Boyd-Monk of Wills Eye Hospital. That was also Patty’s introduction to the American Society of Ophthalmic Registered Nurses (ASORN).

She has continued her education and certifications in ophthalmic nursing. Since 1997, Patty has attended many worldwide ophthalmology meetings and congresses: the annual ASORN meeting, as well as meetings of the AAO, the American Society of Cataract and Refractive Surgery, the Asia-Pacific Academy of Ophthalmology, and the World Ophthalmology Congress. She holds professional certifications as a certified registered nurse in ophthalmology and a clinical nurse specialist in ophthalmic nursing with the College of Nursing in Hong Kong. In 2012, she was awarded Fellow of the Hong Kong College of Surgical Nursing and Fellow of the Provisional Hong Kong Academy of Nursing (Surgery-Ophthalmology) with the Provisional Hong Kong Academy of Nursing.

Patty continues as the coordinator of the Refractive Surgery Center at the Department of Ophthalmology, Optometry, and Contact Lens Clinic, at the Hong Kong Sanatorium and Hospital in Hong Kong. It is, she states, “the most significant accomplishment in my career.”

“Teaching, Teamwork, and Trust” is the motto of the Ophthalmology Department at the Hong Kong Sanatorium and Hospital. Patty believes these qualities are very important for a successful clinic operation. “To build a capable team requires incessant efforts from senior members to teach junior members. Knowledge and experience sharing are important means in nurturing such a team. Developing trust among members is another building block. This can only be achievable if every member is equally committed to the same goal. Without trust, strong and solid teamwork will not be possible.” "Teaching, teamwork, and trust allow Patty’s team to provide patient care that respects life and, when necessary, to face death together. Reading detective stories and traveling are favorite pastimes for Patty. She was born in Hong Kong and has traveled to the United States and other countries many times. “Traveling is a good way to relieve work pressure and rejuvenate for the challenges lying ahead.”

Lorrie J. Durbin, RN, BSN, COMT, Registered Nurse/Ophthalmic Medical Technologist, ASORN Insight Editorial Board, Decatur, IL, ljdurbin@aol.com
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Application deadline - February 1 for certifications expiring in February or March

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Establishes guidelines to provide excellent, consistent, and cost-effective ophthalmic nursing care, and to evaluate professional ophthalmic nursing practice. These universal standards focus on providing nursing care and performing professional role activities while considering variability in nursing roles and environments.

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Mitosol® (mitomycin for solution) Kit for Ophthalmic Use

BRIEF SUMMARY: Please consult package insert for full prescribing information.

INDICATIONS AND USAGE: Mitosol® is an antimitobiole indicated for use as an adjunct to ab externo glaucoma surgery.

CONTRAINDICATIONS:
- Hypersensitivity: Mitosol® is contraindicated in patients that have demonstrated a hypersensitivity to mitomycin in the past. Pregnant women: Mitosol® may cause fetal harm when administered to a pregnant woman. Mitomycin administered parenterally has been shown to be teratogenic in mice and rats when given at doses equivalent to the usual human intravenous dose. Mitosol® is contraindicated in women who are or may become pregnant during therapy. If this drug is used during pregnancy, or if the patient becomes pregnant while taking this drug, the patient should be apprised of the potential hazard to the fetus.

WARNINGS AND PRECAUTIONS:
- Cell Death: Mitomycin is cytotoxic. Use of mitomycin in concentrations higher than 0.2 mg/mL or use for longer than 2 min may lead to unintended corneal and/or scleral damage including thinning or perforation. Direct contact with the corneal endothelium will result in cell death.
- Hypotony: The use of mitomycin has been associated with an increased incidence of post-operative hypotony. Cataract Formation: Use in phakic patients has been correlated to a higher incidence of lenticular change and cataract formation.

ADVERSE REACTIONS:
- Ophthalmic Adverse Reactions: The most frequent adverse reactions to Mitosol® occur locally, as an extension of the pharmacological activity of the drug. These reactions include: Blebitis: bleb ulceration, chronic bleb leak, encapsulated/cystic bleb, bleb-related infection, wound dehiscence, conjunctival necrosis, thin-walled bleb; Cornea: corneal endothelial damage, epithelial defect, anterior synechiae, superficial punctate keratitis, Descemet's detachment. Endophthalmitis; Hypotony: choroidal reactions (choroidal detachment, choroidal effusion, serous choroidal detachment, suprachoroidal hemorrhage, hypotony maculopathy, presence of suprachoroidal fluid, hypoechogenic suprachoroidal effusion); Inflammation: iritis, fibrin reaction; Lens: cataract development, cataract progression, capsule opacification, capsular constriction and/or capsulotomy rupture, posterior synechiae; Retina: retinal pigment epithelial tear, tears may lead to unintended corneal and/or scleral damage; Scleritis: wound dehiscence; Vascular: hypHEMA, central retinal vein occlusion, hemiretinal vein occlusion, retinal hemorrhage, vitreal hemorrhage and blood clot, subconjunctival hemorrhage, disk hemorrhage; Additional Reactions: macular edema, sclera thinning or ulceration, intraocular lens capture, disk swelling, malignant glaucoma, lacrimal drainage system obstruction, ciliary block, corneal vascularization, visual acuity decrease, cystic conjunctival degeneration, upper eyelid retraction, dislocated implants, severe loss of vision.

USE IN SPECIFIC POPULATIONS:
- Pregnancy: Teratogenic Effects: Pregnancy Category X (see Contraindications). Nursing Mother: It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, and because of the potential for serious adverse reactions in nursing infants from Mitosol®, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. It is recommended that women receiving Mitosol® not breast feed because of the potential for serious adverse reactions in nursing infants. Pediatric Use: Safety and effectiveness in pediatric patients have not been established.

More detailed information is available upon request.

For information about Mitosol® contact: 1-877-EYE-MITO (1-877-393-6486)
Please also see full Prescribing Information at MobiusTherapeutics.com
Manufactured for: Mobius Therapeutics, LLC
4041 Forest Park Avenue
St. Louis MO 63108 USA
(314) 615-6930

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YEARS OF EXPERIENCE DOESN’T MAKE IT SAFE.

It’s like walking a tight rope.

You balance “Getting what you Need” and “Doing what you Should”.

You can buy compounded ophthalmic mitomycin off label, but why would you?

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Breathe easy. Go ahead - Look down.

It’s the safety net that you didn’t even know was there.


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INDICATION
Mitosol® (mitomycin for solution) 0.2 mg/vial Kit for Ophthalmic Use is an antimetabolite indicated as an adjunct to ab externo glaucoma surgery.

Dosage & Administration
Mitosol® is intended for topical application to the surgical site of glaucoma filtration surgery and must be reconstituted prior to application. Sponges provided within the Mitosol® Kit should be fully saturated with the entire reconstituted contents in a manner prescribed in the Instructions For Use. The sponges should be applied to the treatment area for two minutes. Reconstituted Mitosol® should be used within one hour of reconstitution.

IMPORTANT SAFETY INFORMATION
Contraindications
Mitosol® is contraindicated in patients who have demonstrated a hypersensitivity to mitomycin, and in women who are or may become pregnant during therapy.

Warnings & Precautions
Cell Death, mitomycin is cytotoxic. Use of mitomycin in concentrations higher than 0.2mg/mL or use for longer than 2 minutes may lead to unintended corneal and/or scleral damage including thinning or perforation. Direct contact with the corneal endothelium will result in cell death.

Hypotony. The use of mitomycin has been associated with an increased instance of post-operative hypotony.

Cataract Development. Use in phakic patients has been correlated to higher instance of lenticular change and cataract formation.

Adverse events and reactions
The most frequent adverse reactions to Mitosol® occur locally and include hypotony, hypotony maculopathy, blebitis, endophthalmitis, vascular reactions, corneal reactions, and cataract.

1 The latest directives from FDA regarding compounded medications, guidance from the American Society of Health System Pharmacists (ASHP) and the recognition of the Ophthalmic Mutual Insurance Company (OMIC), that states that “Mitosol is the FDA approved ophthalmic formulation of Mitomycin-C.”

For brief prescribing information visit www.mobiustherapeutics.com.